REMARKS

This timely filed Reply is responsive to the Office Action dated May 5, 2005. This Reply is accompanied by a petition for two-month extension of time along with an authorization to charge the required statutory fee.

In this Reply, claims 7, 8, 10 and 11 have been amended and new claims 12-14 have been added. No new matter has been added. Support for the amendment of claim 7 which recites welding only one end of the electrode stack to its terminal prior to being positioned within the housing (cell sleeve) and then welding the other electrode stack to its terminal after the positioning step is found, for example, in the first paragraph of page 5 (copied below):

> After the cathodes of the bipolar electrode stack 40 are ultrasonically welded to the cathode terminal 44, the cell sleeve 12 may be slid over the stack. Then the cathode cell terminal 44 may be pivoted as shown in FIG. 5 onto the end 23 of the cell sleeve. The anodes of the bipolar stack, as shown in FIGS. 5 and 7, may be then ultrasonically welded to the anode cell terminal 60. The anode cell terminal 60 has a lip portion 70 as best shown in FIGS. 5 and 7. The anode cell terminal 60 may then be pivoted onto the end of the cell sleeve 21 as shown in FIG. 8. The lithium ion battery takes on the appearance of a cell can as shown in FIG. 10. It is then ready for crimping to secure the bipolar stack within the sleeve as shown in FIGS. 9 and 10. The cell terminals are crimped about the cell sleeve in four stages as shown schematically in FIGS. 11, 12, 13, and 14. Only the cathode end is depicted in FIGS. 11-14. Clearly the same is applicable on the anode side as well. The plastic sleeve 16 is depicted in FIGS. 11-14, and its extension 22 fits snugly within the cell sleeve 12. As can be seen in FIGS. 11-14, the sleeve extension 22 electrically insulates the cathode 44 from the cell housing 12.

Support for amended claim 10 which recites "wherein said anode cell terminal or said cathode cell terminal includes a one way valve housing including a port attached thereto, further comprising the steps of inserting electrolyte into said port followed by inserting a gas release vent into said port" can be found in the first paragraph of page 4. Support for claim 12 which recites "wherein said one-way valve housing includes threading on its outside surface" can be found in Fig. 2A. Support for claim 13 which recites "wherein said anode cell terminal and said cathode cell terminal are exposed for current collection along their full area" can be found in Figs. 5-8 and 10 and the accompanying specification. Support for claim 14 which recites "wherein said housing includes end protective plastic sleeves which fit within said housing to secure and isolate said plurality of stacked lithium cells therein, said plastic sleeves serving as gaskets for said anode cell terminal and said cathode cell terminal can be found in the last paragraph of page 3 as well as other portions of the specification.

Claim 10 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Former claim 10 had recited "inserting a gas release vent into a port in *the* one-way valve housing attached to the anode cell terminal." Amended claim 10 now provides proper antecedent basis by reciting " wherein said anode cell terminal or said cathode cell terminal includes a one way valve housing including a port attached thereto, further comprising the steps of inserting electrolyte into said port followed by inserting a gas release vent into said port". Accordingly, the 35 U.S.C. § 112, second paragraph rejection regarding claim 10 is now overcome.

Turning now to rejections based on cited art, claims 7, 8 and 11 were rejected under 35 U.S.C. § 102(b) as being anticipated by newly cited Kojima et al. (US 5,741,608). Regarding Kojima the Examiner asserts that:

Kojima et al., teach a method of manufacturing a lithium ion battery comprising the steps of providing a plurality of stacked lithium cells with a polymer separator (col. 3, lines 4-11); positioning the stacked cells within a housing (col. 10, claim 15; Fig. 2 and 3); welding anode collectors to an inside surface of the anode terminal and cathode collectors to inside surface of cathode terminal (col. 4, lines 33-44); and assembling the anode terminal at one end of the housing and the cathode terminal at the opposite end (Fig. 3), wherein the stacked cells are enclosed within the housing (Fig. 3; col. 10, claim 15). It also teaches the welding step comprises ultrasonic welding (col. 4, lines 33-40). It teaches the housing is in the configuration of an open rectangular sleeve prior to positioning the stacked cells (Fig. 2).

Before reviewing Kojima, Applicants will first review the claimed invention now recited in amended claim 7. Amended claim 7 recites a method of manufacturing a lithium ion battery, comprising the steps of:

A method of manufacturing a lithium ion battery, comprising the steps of:

providing a plurality of stacked lithium cells with a polymer separator there between;

welding all anode current collectors of said plurality of stacked cells to an inside surface of an anode terminal or all cathode current collectors of said plurality of stacked cells to an inside surface of a cathode terminal;

positioning the stacked cells longitudinally within a four-sided housing [the cell sleeve] having a front and a backside;

after said positioning step, welding the other of said anode current collectors and said cathode current collectors to said inside surface of said anode terminal and said inside surface of said cathode terminal, respectively; and

assembling the anode cell terminal at one end of the housing [the cell sleeve] and the cathode cell terminal at the opposite end of the housing, wherein the plurality of stacked cells are enclosed within the housing by said anode cell terminal and said cathode cell terminal.

Kojima is entitled " Multi-layer type nonaqueous electrolyte secondary cell" and discloses minimizing internal shorting of large capacity multi-layer type nonaqueous electrolyte secondary cells by inclusion of heat resistant porous film layers adjacent thermally fusible resin microporous films disposed between negative electrodes and positive electrodes in an electrode assembly and between adjacent electrode assemblies stacked together to provide an electrode stack. The heat resistant porous film layers may be organic or inorganic temperature resistant sheet materials exhibiting heat resistance to temperatures of at least about 600 C.

As noted in col. 4, lines 33-51 (copied below), Kojima teaches the electrode stack of both anode and cathodes are ultrasonically welded to their respective terminals, and are then dropped into a *five* sided cell case, not the "open rectangular sleeve" asserted by the Examiner. (See Fig 2). The electrode stack assembly is covered with a polyamide sheet (insulator) (see paragraph 45 column 4) and is then bolted to the cell case cover. The terminals are insulated from the cell case cover using an o-ring and insulating ring. Then the electrode stack and cell case cover assembly is dropped into the five sided cell case and is laser welded to the top edge of five sided cell case.

Also, as shown in FIG. 3, one side of the electrode stack 14, i.e., the lead sections 5a exposed from the separator 8 of the positive electrodes 2 are welded by ultrasonic methods to the positive terminal 11 of aluminum in parallelopipedal form. Further, the other side of the electrode stack 14, i.e., the lead sections 7a of the negative electrodes 3 exposed from the separator 8 are welded by ultrasonic methods to the negative terminal 12 of copper in parallelopipedal form.

The outer periphery of the electrode stack 14 with the positive terminal 11 and the negative terminal 12 welded thereto as shown in FIG. 3 is covered with an insulating sheet of a

125 μm thick polyimide film. The resulting assembly is bolted to the upper cover 10b by means of the positive terminal 11 and the negative terminal 12 through an O-ring and an insulating ring (not shown in FIG. 3). After that, the assembly is inserted in the cell case body 10a, and the upper cover 10b is fixedly laser-welded to the cell case body 10a.

Kojima's design results in battery where the current is drawn from only one end of the terminals and out the top cover through positive terminal 11 and negative terminal. This arrangement results in undesirable high current density (hot spots) near terminals 11 and 12.

In contrast to Kojima who teaches dropping a cell stack into a *five* sided cell case and then bolting the cell case cover to complete the enclosed housing, Applicants' claimed method uses a four sided housing (cell sleeve), where upon assembly the respective cell terminals together serve to enclose the housing (cell sleeve). Moreover, in Kojima the electrode stack of *both* anode and cathodes are ultrasonically welded to their respective terminals prior to being dropped into the cell case (the cell case clearly having a footprint larger than the cell stack), while Applicants' claim 7 recites "welding all anode current collectors of said plurality of stacked cells to an inside surface of an anode terminal or all cathode current collectors of said plurality of stacked cells to an inside surface of a cathode terminal", "positioning the stacked cells longitudinally within a housing having a front and a backside"; and then "after said positioning step, welding the other of said anode current collectors and said cathode current collectors to said inside surface of said anode terminal and said inside surface of said cathode terminal, respectively". Applicants' terminals have a larger footprint than the four sided housing and thus cannot be slid into the housing after welding both terminals as taught in Kojima. Applicants' recited sequence of steps is thus a significantly different sequence of manufacturing steps, using significantly different housing components and thus results in a significantly different and improved design result. One significant advantage of Applicants' recited method is that the end cell terminals are exposed for current collection along the full area of the electrodes, not out small area terminals as taught by the Kojima method and associated design. Accordingly, Applicants submit that amended claim 7 and claims dependent thereon are all patentable claims.

Several dependent claims recite independently patentable limitations. Claim 10 recites "wherein said anode cell terminal or said cathode cell terminal includes a one way valve housing including a port attached thereto, further comprising the steps of inserting electrolyte into said port followed by inserting a gas release vent into said port". The one-way vent (valve) is a safety device for allowing the escape of a gas in the event of a abnormal build up of gases and then

preventing the rupture of the cell can (battery case). Claim 12 recites "wherein said one-way valve housing includes threading on its outside surface". The threads on the outside of the one-way valve housing permit attaching the electrolyte dispensing connector for filling the cell with electrolyte and for attaching the one-way valve (check valve) insertion device. Claim 13 recites "wherein said anode cell terminal and said cathode cell terminal are exposed and provide current collection along their full area". As noted above in Kojima current is drawn from one end of the terminals and out the top cover. Claim 15 recites "wherein said housing includes end protective plastic sleeves which fit within said housing to secure and isolate said plurality of stacked lithium cells therein, said plastic sleeves serving as gaskets for said anode cell terminal and said cathode cell terminal". Thus, the plastic sleeves not only act as insulators but also as gaskets.

Applicants have made every effort to present claims which distinguish over the cited art, and it is believed that all claims are in condition for allowance. However, Applicants invite the Examiner to call the undersigned if it is believed that a telephonic interview (direct line (561) 671-3662) would expedite the prosecution of the application to an allowance. The Commissioner for Patents is hereby authorized to charge any deficiency in fees due or credit an excess in fees with the filing of the papers submitted herein during prosecution of this application to Deposit Account No. 50-0951.

Respectfully submitted,

AKERMAN SENTERFITT

Date: September 9, 2005

Neil R. Jetter
Registration No. 46,803
Akerman Senterfitt
P.O. Box 3188
West Palm Beach, FL 33402-3188
Tel: 561-653-5000

Docket No. 7892-39DIV